Complete Summary

GUIDELINE TITLE

Clinical practice guideline: diagnosis and management of childhood obstructive sleep apnea syndrome.

BIBLIOGRAPHIC SOURCE(S)

Clinical practice guideline: diagnosis and management of childhood obstructive sleep apnea syndrome. Pediatrics 2002 Apr;109(4):704-12. [63 references] PubMed

COMPLETE SUMMARY CONTENT

SCOPE

DISEASE/CONDITION(S)

Obstructive sleep apnea syndrome (OSAS)

GUIDELINE CATEGORY

Diagnosis
Management

CLINICAL SPECIALTY

Family Practice
Neurology
Otolaryngology
Pediatrics
Pulmonary Medicine
Sleep Medicine

INTENDED USERS

Advanced Practice Nurses
Allied Health Personnel
Physician Assistants
Physicians

GUIDELINE OBJECTIVE(S)

- To increase the recognition of obstructive sleep apnea syndrome (OSAS) by pediatricians
- To decrease diagnostic delay and avoid serious sequelae of obstructive sleep apnea syndrome
- To evaluate diagnostic techniques
- To describe treatment options
- To provide guidelines for follow-up
- To discuss areas requiring additional research

TARGET POPULATION

Healthy children older than 1 year of age with uncomplicated obstructive sleep apnea syndrome (OSAS), such as OSAS associated with adenotonsillar hypertrophy and/or obesity, who are being treated in the primary care setting.

These guidelines are not intended for use in the following populations:

- Infants younger than 1 year
- Patients with central apnea or hypoventilation syndromes
- Patients with OSAS associated with other medical disorders, including but not limited to Down syndrome, craniofacial anomalies, neuromuscular disease (including cerebral palsy), chronic lung disease, sickle cell disease, metabolic disease, or laryngomalacia
- Patients with life-threatening OSAS who present in cardiorespiratory failure

INTERVENTIONS AND PRACTICES CONSIDERED

Diagnosis

1. History and physical examination
2. Questionnaires
3. Audiotaping or videotaping
4. Nocturnal pulse oximetry
5. Polysomnography (PSG)
    - Nap polysomnography
    - Ambulatory polysomnography
    - Comprehensive overnight polysomnography

Management/Treatment

1. Referral to a specialist
2. Adenotonsillectomy (tonsillectomy and adenoidectomy alone are considered but not recommended)
3. Continuous positive airway pressure (CPAP)

4. Oxygen therapy; adjunctive measures, such as avoidance of indoor allergens and weight loss; other surgical options
5. Postoperative evaluation and monitoring

MAJOR OUTCOMES CONSIDERED

- Prevalence of obstructive sleep apnea syndrome (OSAS) and primary snoring
- Sequelae of OSAS (e.g., cognitive and behavioral abnormalities, growth inhibition, cardiovascular complications)
- Reliability of diagnostic measures (positive/negative predictive values, sensitivity, specificity of tests)
- Symptoms of OSAS (e.g., snoring, apnea-hypopnea index)
- Adverse effects or complications of treatment of OSAS

METHODOLOGY

METHODS USED TO COLLECT/SELECT EVIDENCE

Hand-searches of Published Literature (Primary Sources)
Searches of Electronic Databases

DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

A computerized search of the National Library of Medicine's PubMed database from 1966-1999 (later updated to include 2000) was performed using the following keywords: sleep apnea syndrome, apnea, sleep disorders, snoring, polysomnography, airway obstruction, adenoidectomy, tonsillectomy (adverse effects, mortality), and sleep-disordered breathing. The search was limited to articles involving children. Studies involving infants, animal studies, and articles written in languages other than English were excluded. Reviews, case reports, letters to the editor, and abstracts were not included. In addition to the literature search, committee members supplemented the articles with additional publications thought to be relevant and with those published after 1999.

NUMBER OF SOURCE DOCUMENTS

Total number of articles found: 2110.

Total number of articles reviewed after screening: 278.

Total number of articles providing relevant original data for analysis: 113.

METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Weighting According to a Rating Scheme (Scheme Given)

RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

Rating levels of studies on treatment efficacy:

Level I: Randomized trials with low rates of false-positive and/or false-negative results (high power).

Level II: Randomized trials with high rates of false-positive and/or false-negative results (low power).

Level III: Nonrandomized concurrent cohort comparisons between contemporaneous patients who did and did not receive an intervention, or case-control or cross-sectional studies with appropriate control group.

Level IV: Nonrandomized historical cohort comparisons between current patients who received an intervention and former patients (from the same institution or from the literature) who did not, or case-control or cross-sectional studies for which control groups were suboptimally chosen.

Level V: Case series without controls.

Rating levels for diagnostic tests:

Level 1: Independent blind comparison of patients from an appropriate spectrum of patients, all of whom have undergone both the diagnostic test and the reference standard.

Level 2: Independent blind or objective comparison performed in a set of nonconsecutive patients or confined to a narrow spectrum of study individuals (or both), all of whom have undergone both the diagnostic test and the reference standard.

Level 3: Independent blind or objective comparison of an appropriate spectrum of patients, but the reference standard was not applied to all.

Level 4: Reference standard was unobjective, unblinded, or not independent; positive and negative tests were verified using separate reference standards; or study was performed in an inappropriate spectrum of patients.

METHODS USED TO ANALYZE THE EVIDENCE

Meta-Analysis
Systematic Review with Evidence Tables

DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

Articles deemed possibly relevant were printed and distributed to committee members for more detailed review. A literature review form was developed for this project to standardize this part of the process. Because there were a large number of articles requiring evaluation, some committee members recruited residents and fellows to assist in the performance of these reviews under their supervision. Although it became clear at this point that the number of articles that could be considered high quality by conventional epidemiologic standards was small, a low threshold was used to allow inclusion of any possibly relevant articles into the next level of review. At this point, articles were compiled and divided by

the committee chair, additional articles were obtained by a review of literature, committee members' files were added, and committee members were assigned specific topics for detailed review and compilation of evidence tables. The findings of committee members were then presented at a follow-up meeting of the entire committee. A final review and compilation into evidence tables was performed by the lead author of the technical report accompanying the original guideline.

Calculation of prevalence, diagnostic test characteristics, and odds ratios were performed independently of the authors´ reports, using data provided in the original articles. In 2 cases, authors were contacted for clarification of data. Where applicable, odds ratios from different studies were combined, using Mantel-Haenszel weights in stratified tables. Tests for heterogeneity are reported. All statistical calculations were performed using Stata 5.0 software (Stata Corporation, College Station, TX).

METHODS USED TO FORMULATE THE RECOMMENDATIONS

Expert Consensus

DESCRIPTION OF METHODS USED TO FORMULATE THE RECOMMENDATIONS

Not stated

RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

Not applicable

COST ANALYSIS

A formal cost analysis was not performed and published cost analyses were not reviewed.

METHOD OF GUIDELINE VALIDATION

Peer Review

DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

Not stated

RECOMMENDATIONS

MAJOR RECOMMENDATIONS

Summary of Recommendations for the Diagnosis and Management of Uncomplicated Childhood OSAS

The following recommendations accompany an algorithm (Figure 1 in the original guideline document). These recommendations relate to otherwise healthy children

older than 1 year with obstructive sleep apnea syndrome (OSAS) secondary to adenotonsillar hypertrophy and/or obesity and who are not in cardiorespiratory failure.

1. All children should be screened for snoring. As part of routine health care maintenance for all children, pediatricians should ask whether the patient snores. An affirmative answer should be followed by a more detailed evaluation. (Evidence for this recommendation is good, and the strength of the recommendation is strong.)
2. Complex, high-risk patients (Fig.1 in the original guideline document) should be referred to a specialist. (Evidence is good that these children are at increased surgical risk and require more complex management; the strength of the recommendation is strong.)
3. Patients with cardiorespiratory failure cannot await elective evaluation. It is expected that these patients will be in an intensive care setting and will be treated by a specialist; thus, these patients are not covered in this practice guideline.
4. Thorough diagnostic evaluation should be performed. History and physical examination have been shown to be poor at discriminating between primary snoring (PS) and OSAS (evidence is strong). Polysomnography is the only method that quantifies ventilatory and sleep abnormalities and is recommended as the diagnostic test of choice. Other diagnostic techniques, such as videotaping, nocturnal pulse oximetry, and daytime nap studies, may be useful in discriminating between primary snoring and OSAS if results of polysomnography are positive. However, they do not assess the severity of OSAS, which is useful for determining treatment and follow-up. In any case, because of their high rate of false-negative results, polysomnography should be performed in the event of negative results of the other diagnostic techniques. Additional study of audiotaping is necessary. (Evidence for and strength of the recommendation are strong.)
5. Adenotonsillectomy is the first line of treatment for most children. Continuous positive airway pressure (CPAP) is an option for those who are not candidates for surgery or do not respond to surgery. (Evidence for and strength of the recommendation are strong.)
6. High-risk patients should be monitored as inpatients postoperatively. (Evidence that these patients are at high risk of postoperative complications is strong. Strength of the recommendation is strong.)
7. Patients should be reevaluated postoperatively to determine whether additional treatment is required. All patients should undergo clinical reevaluation. High-risk patients should undergo objective testing. (Evidence is good, strength of the recommendation is strong.)

CLINICAL ALGORITHM(S)

An algorithm is provided for the diagnosis and management of uncomplicated childhood obstructive sleep apnea syndrome.

EVIDENCE SUPPORTING THE RECOMMENDATIONS

TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

The type of supporting evidence is specifically stated for each recommendation (see "Major Recommendations" section).

The recommendations were based primarily on a comprehensive review of published reports. In cases where the data did not appear conclusive, recommendations were based on the consensus opinion of the group.

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

POTENTIAL BENEFITS

Diagnosis

- In general, the recommended diagnostic modalities may (1) aid in identifying patients who are at risk for adverse outcomes, (2) avoid unnecessary interventions in patients who are not at risk for adverse outcomes, (3) evaluate which patients are at increased risk of complications resulting from adenotonsillectomy so that appropriate precautions can be taken.
- Overnight polysomnography is currently the only reliable diagnostic modality that can differentiate obstructive sleep apnea syndrome (OSAS) from primary snoring.

Treatment

- On the basis of a case series that were reported with variable rigor, it appears that adenotonsillectomy is curative in 75% to 100% of children, even if the children are obese.
- Continuous positive airway pressure is effective in children for the treatment of obstructive sleep apnea syndrome, but is usually used when adenotonsillectomy is delayed, contraindicated, or unsuccessful rather than as a primary treatment.

POTENTIAL HARMS

Adenotonsillectomy poses a high risk of postoperative complications, particularly respiratory compromise. Death attributable to respiratory complications in the immediate postoperative period has been reported in patients with severe obstructive sleep apnea syndrome (OSAS).

Subgroups Most Likely to be Harmed:

Risk factors for postoperative respiratory complications in children with obstructive sleep apnea syndrome (OSAS) undergoing adenotonsillectomy are:

- Age younger than 3 years
- Severe OSAS on polysomnography
- Cardiac complications of OSAS (e.g., right ventricular hypertrophy)
- Failure to thrive
- Obesity
- Prematurity
- Recent respiratory infection

- Craniofacial anomalies (not discussed in guidelines)
- Neuromuscular disorders (not discussed in guidelines)

QUALIFYING STATEMENTS

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- This clinical practice guideline is not intended as a sole source of guidance in the evaluation of children with obstructive sleep apnea syndrome. Rather, it is designed to assist primary care clinicians by providing a framework for diagnostic decision-making. It is not intended to replace clinical judgment or to establish a protocol for all children with this condition and may not provide the only appropriate approach to this problem.
- Review of the literature revealed that there were very few randomized controlled studies.

IMPLEMENTATION OF THE GUIDELINE

DESCRIPTION OF IMPLEMENTATION STRATEGY

An implementation strategy was not provided.

INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

IOM CARE NEED

Getting Better
Living with Illness

IOM DOMAIN

Effectiveness

IDENTIFYING INFORMATION AND AVAILABILITY

BIBLIOGRAPHIC SOURCE(S)

Clinical practice guideline: diagnosis and management of childhood obstructive sleep apnea syndrome. Pediatrics 2002 Apr;109(4):704-12. [63 references] PubMed

ADAPTATION

Not applicable: The guideline was not adapted from another source.

DATE RELEASED

2002 Apr

GUIDELINE DEVELOPER(S)

American Academy of Pediatrics - Medical Specialty Society

SOURCE(S) OF FUNDING

American Academy of Pediatrics

GUIDELINE COMMITTEE

Subcommittee on Obstructive Sleep Apnea Syndrome

COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE

Subcommittee Members: Carole L. Marcus, MBBCh (Chairperson); Dale Chapman, MD; Sally Davidson Ward, MD; Susanna A. McColley, MD

Liaisons: Lee J. Brooks, MD; Jacqueline Jones, MD; Michael S. Schechter, MD, MPH

Staff: Carla T. Herrerias, MPH

FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

Not stated

GUIDELINE STATUS

This is the current release of the guideline.

AAP Policies are reviewed every 3 years by the authoring body, at which time a recommendation is made that the policy be retired, revised, or reaffirmed without change. Until the Board of Directors approves a revision or reaffirmation, or retires a statement, the current policy remains in effect.

GUIDELINE AVAILABILITY

Electronic copies: Available from the American Academy of Pediatrics (AAP) Policy Web site.

Print copies: Available from American Academy of Pediatrics, 141 Northwest Point Blvd., P.O. Box 927, Elk Grove Village, IL 60009-0927.

AVAILABILITY OF COMPANION DOCUMENTS

The following is available:

- Technical Report: diagnosis and management of childhood obstructive sleep apnea syndrome. Pediatrics 2002 Apr;109(4):e69

Electronic copies: Available in HTML format from the American Academy of Pediatrics Policy (AAP) Web site.

Print copies: Available from American Academy of Pediatrics, 141 Northwest Point Blvd., P.O. Box 927, Elk Grove Village, IL 60009-0927.

PATIENT RESOURCES

None available

NGC STATUS

This NGC summary was completed by ECRI on September 6, 2002. The information was verified by the guideline developer on October 11, 2002.

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Date Modified: 11/15/2004